

Unique or Innovative Signal Designs



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"A Picture is worth a 1000 words"

Pedestrian Blankout Sign:

Glenwood Ave. at Wade Ave. WB Ramp in Raleigh

- Heavy Volume, Dual Lane Ramp
- Formerly Single Lane Free Flow – Motorists not used to stopping/yielding
- School Nearby -> Pedestrian Activity
- Peds concerned about being seen if driver is focused on turning right on red (driver turning back to look over shoulder.
- Countermeasure: “No Turn on Red” Blankout Sign when Ped phase is active











Blue car appears to be turning Right on Red even though Blankout sign is on.





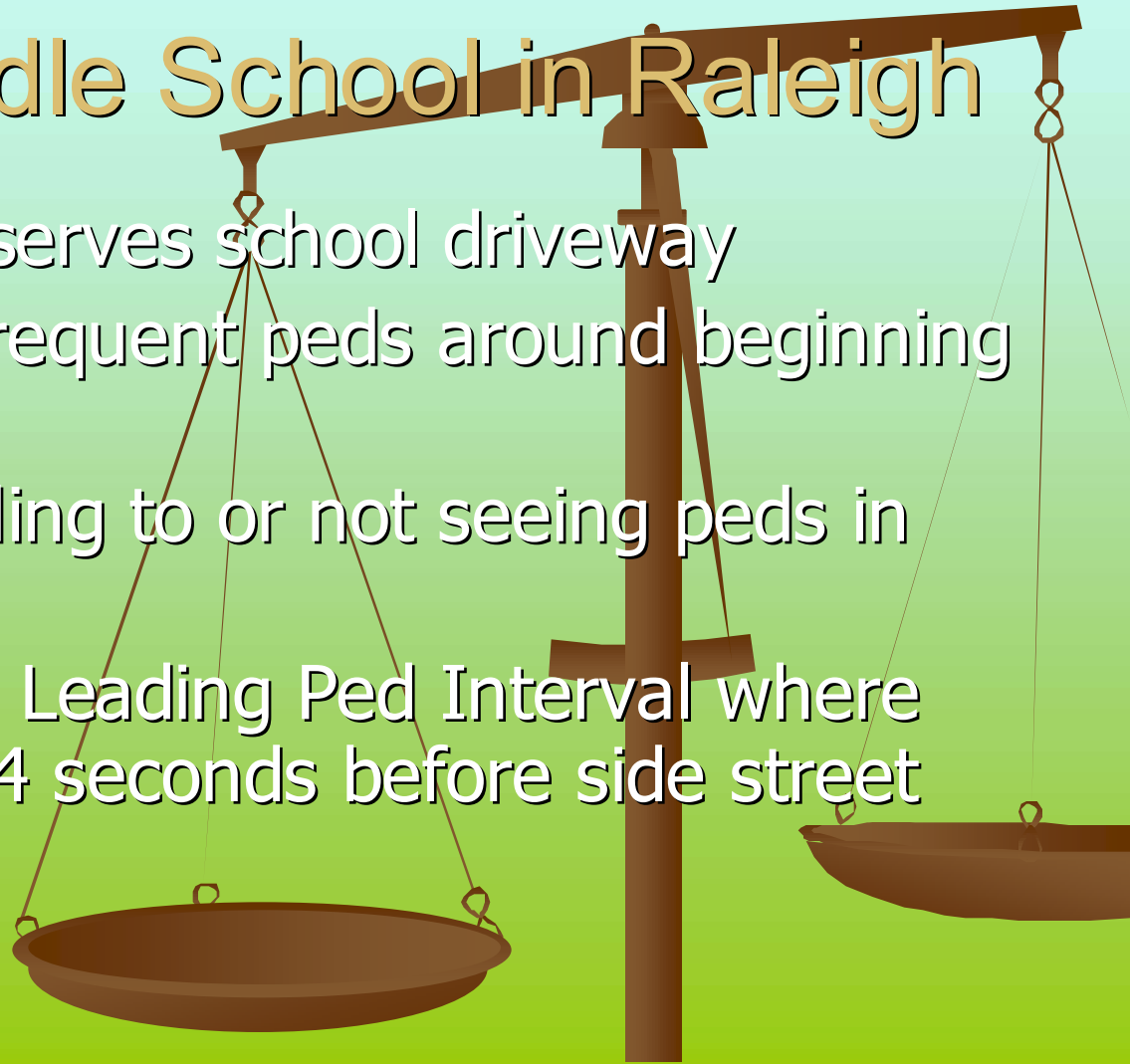
Notice how far driver has to turn their head around, paying no attention to crosswalk.



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Leading Pedestrian Interval: Spring Forest Road at East Millbrook Middle School in Raleigh

- One leg of signal serves school driveway
- Middle School – Frequent peds around beginning and end of school
- Motorists not yielding to or not seeing peds in crosswalk
- Countermeasure: Leading Ped Interval where Walk is displayed 4 seconds before side street Green





Seems like normal signal, red and Solid Don't Walk.



Ped heads show Walk, but vehicle signal heads still show Red.



Now vehicle heads go green (side street call was my Walk phase)



Flashing Don't Walk Countdown display; Still Green signal heads



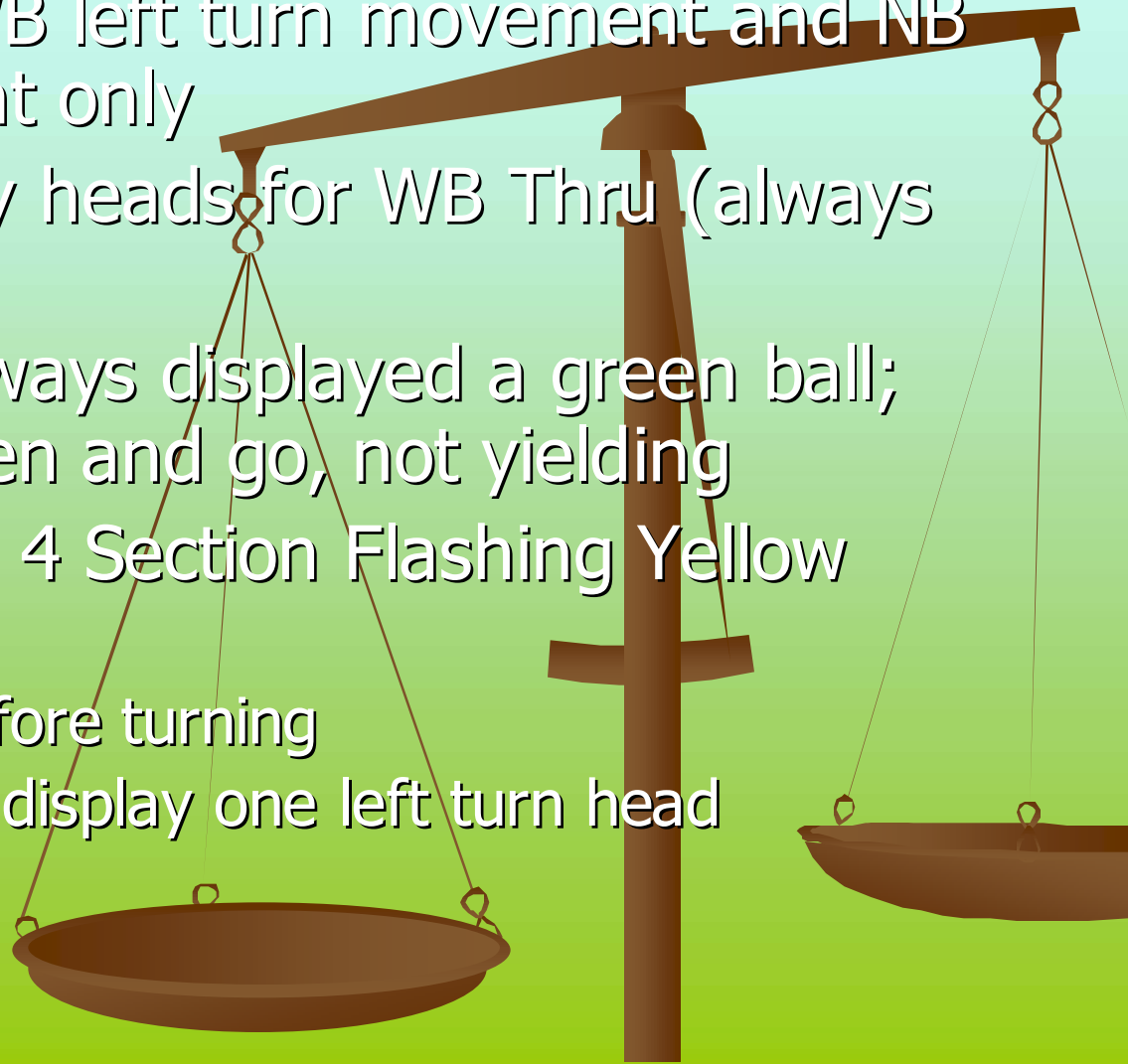
Countdown terminates as signal changes to Yellow.



Normal side street Green without Ped Call (Walk).

4 Section Flashing Yellow Arrow: US 64 at Kelly Road in Apex

- Only signaling WB left turn movement and NB Kelly Road for right only
- No need to display heads for WB Thru (always would be Green)
- 5 Section head always displayed a green ball; Motorists see Green and go, not yielding
- Countermeasure: 4 Section Flashing Yellow Arrow
 - Motorists Yield before turning
 - Good way to only display one left turn head





WB Left Turn Green Arrow during Protected display



Westbound: FYA for lefts, no heads for through traffic





WB Left Turn Waiting on the Flashing Yellow Arrow



NB Right Turn only heads



Kelly Road does continue North of US 64, but right turn only here.



Kelly Road does continue North of US 64, but right turn only here.

3 Section Flashing Yellow Arrow: Military Cutoff Road at Gordon Road in Wilmington.

- Heavy Dual NB Lefts opposing permitted left/U-Turn into Rescue Squad
- Red Revert for Dual Lefts creating coordination issues
- Needed to Lag NB Dual Left -> Protect SB Left (adds another phase and creates additional delay) or use 3 section FYA

Photos Courtesy of Pate Butler



SB Permitted Left opposing NB Dual Lefts



3 Section Flashing Yellow Arrow for SB Left/U-Turn (No Green displayed)

A Mix of Ideas: NC 5 at Morganton Road in Pinehurst

- 4 Section Flashing Yellow Arrows installed to help lag left turns (short SB left turn storage lane)
- Railroad Preemption
- Golf Cart Crossing
 - Special Railroad Gates
 - Exclusive “Ped” Phase for Golf Carts activated by loops in Cart Path (pushbutton for walkers)





Instruction Signs for Golf carts (use Ped Signals not vehicle signals)



More Instruction Signs





Loop Detection in cart path for golf carts



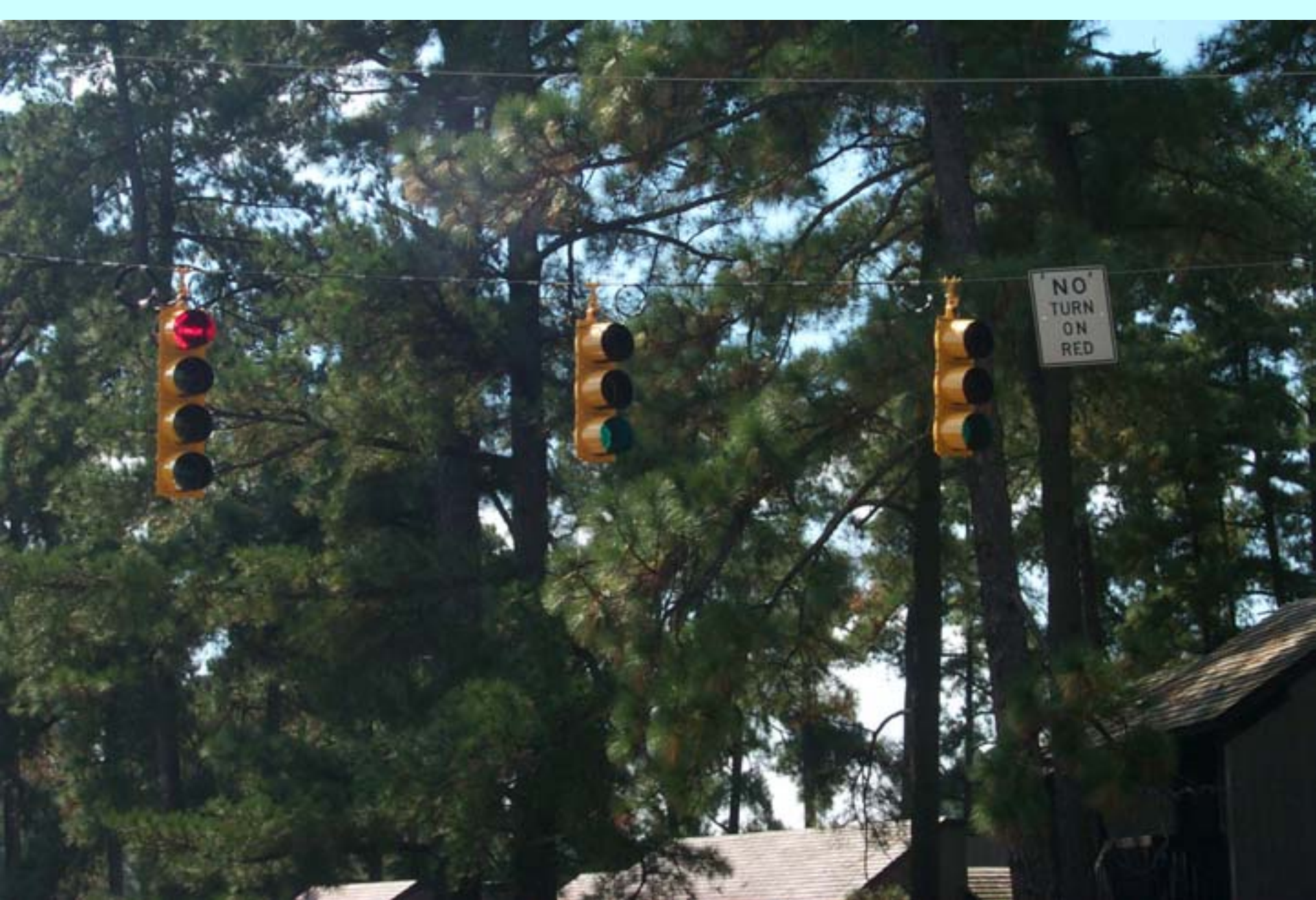
Exclusive Ped Phase – Notice Blankout Signs Prohibiting Right Turns on Red



The Gates and Flashers really do operate



SB Normal Operation – in FYA Mode



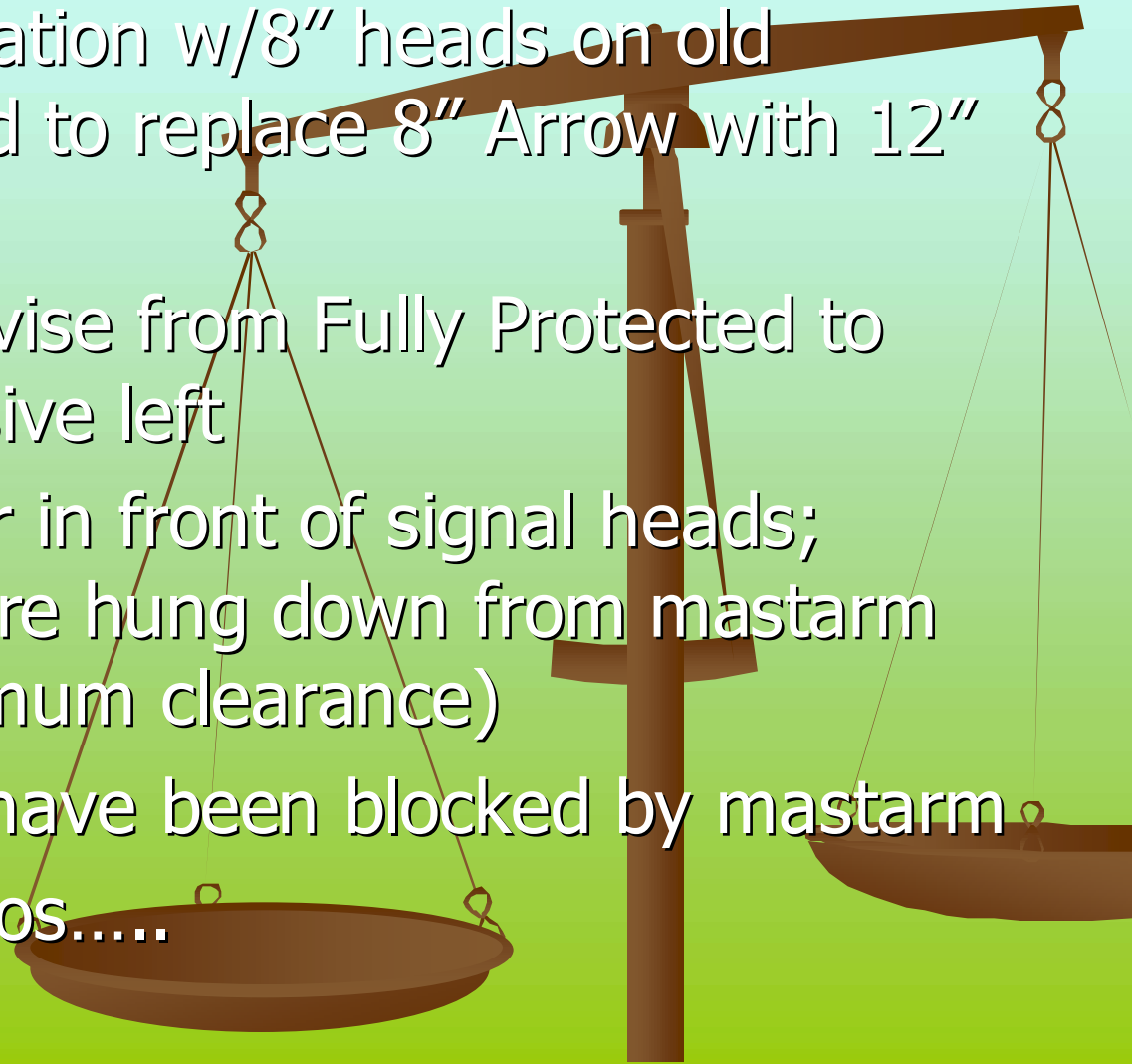
SB Heads During Railroad Preemption – Notice Red Arrow in place of Blankout Sign

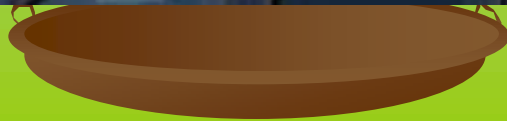


SB Left is receiving Green Arrow (lag) while NB thrus are stopped; NB Lefts have FYA

Horizontal Signal Heads: 10th at Dickinson in Greenville

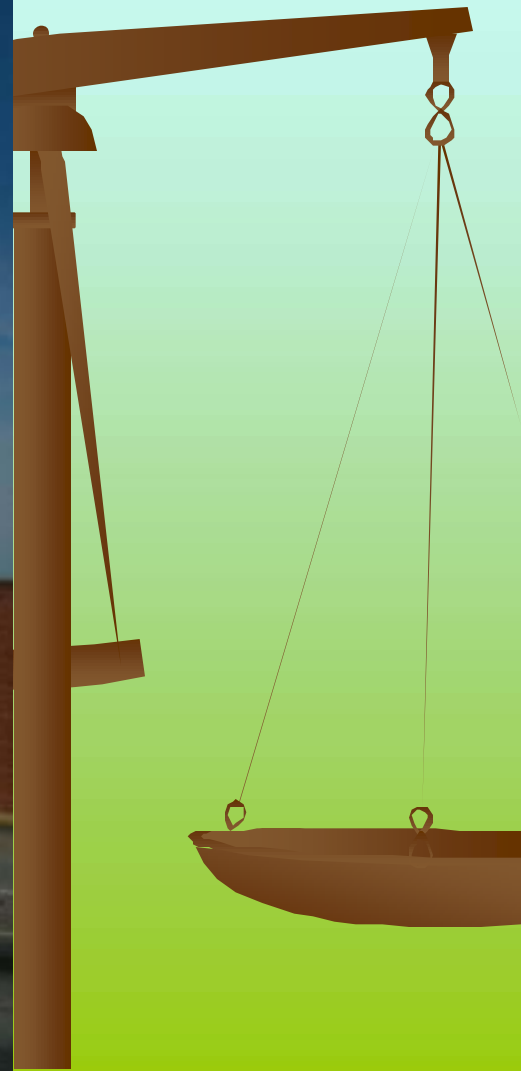
- Existing urban location w/8" heads on old mastarms; needed to replace 8" Arrow with 12" display
- Also wanted to revise from Fully Protected to Protected/Permissive left
- Railroad cantilever in front of signal heads; existing heads were hung down from mastarm for visibility (minimum clearance)
- 12" heads would have been blocked by mastarm
- The "before" photos.....







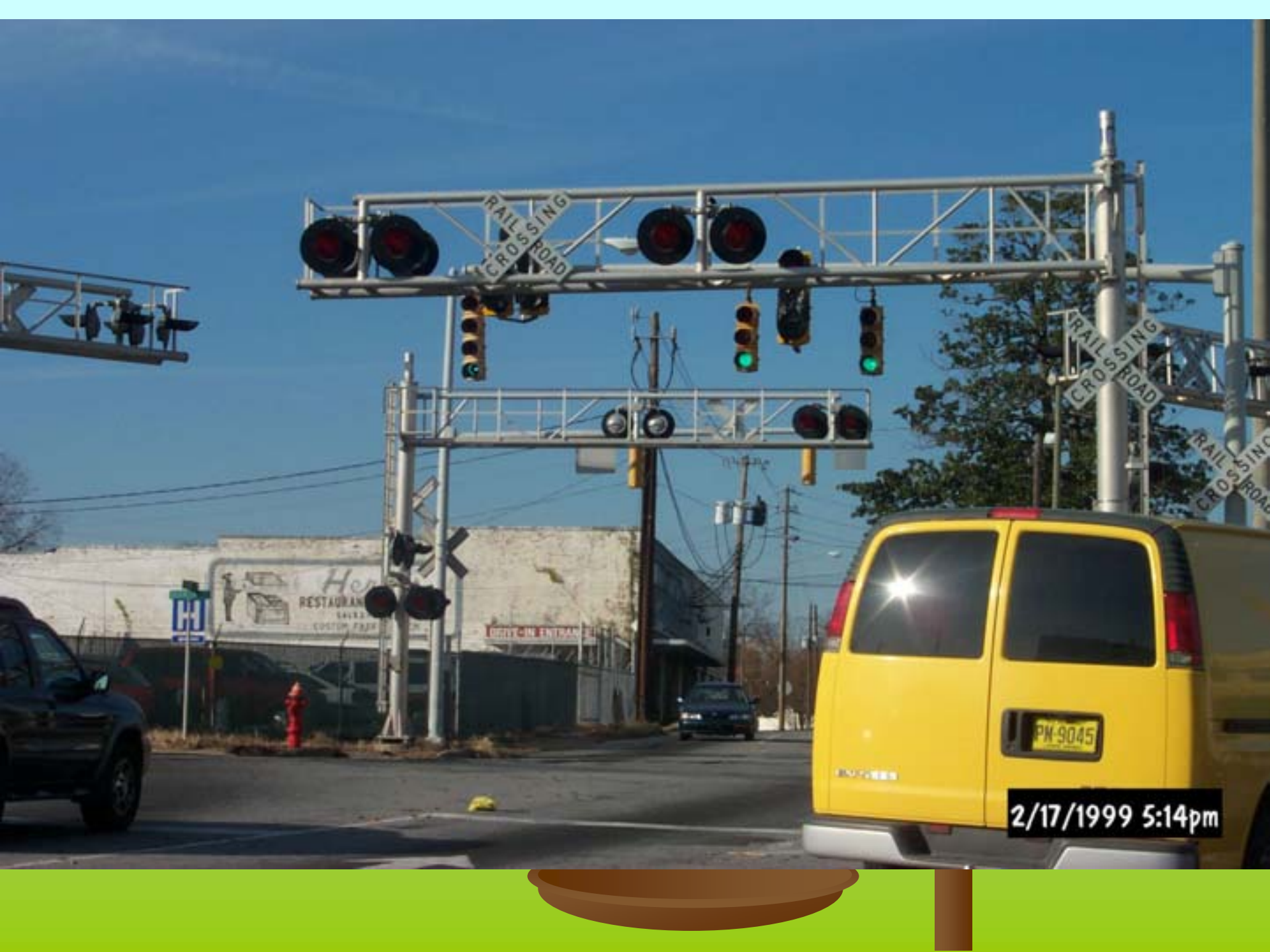
2/17/1999 5:30pm





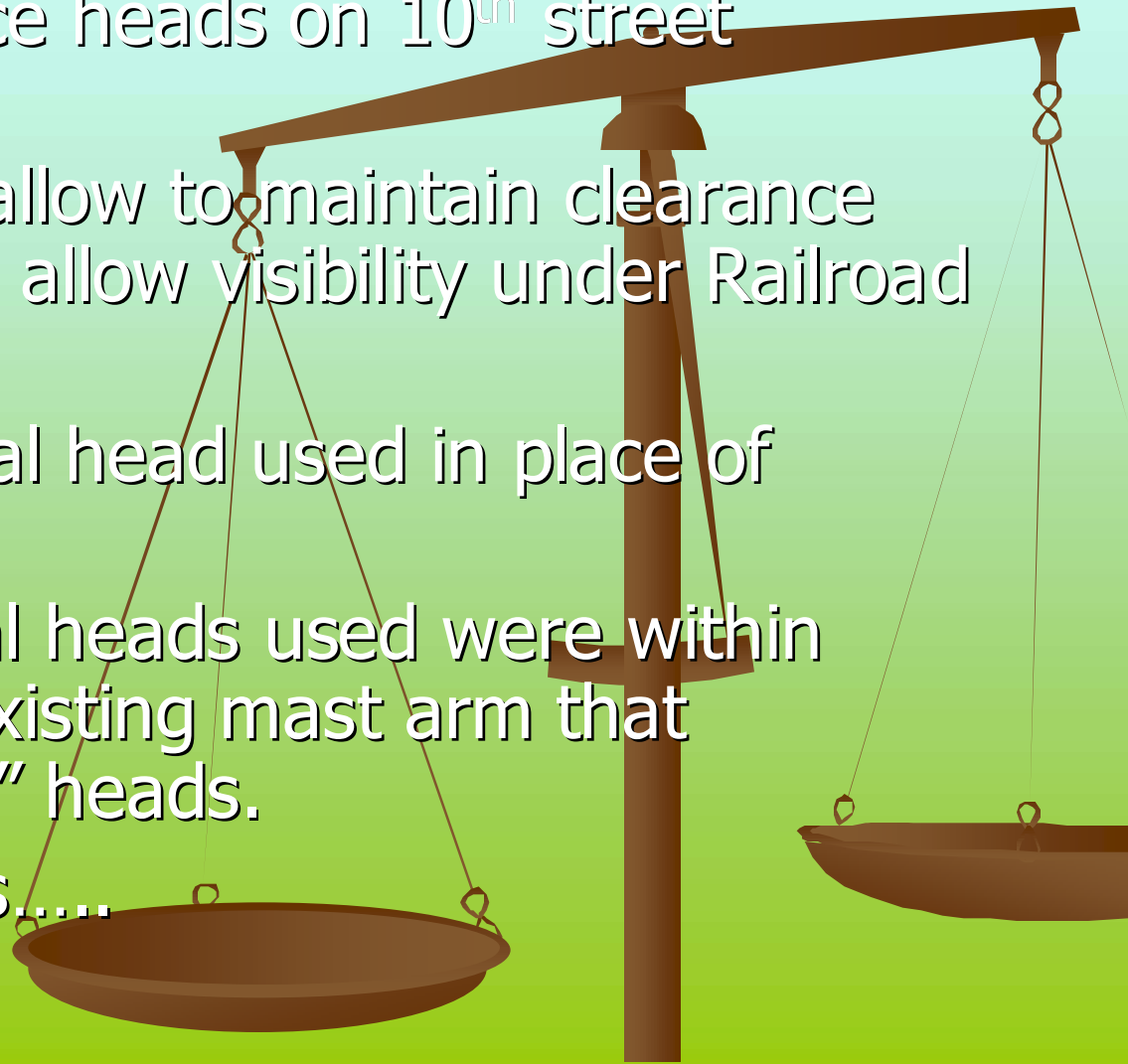


Substandard Railroad Crossbuck on Opposite Approach



Horizontal Signal Heads: 10th at Dickinson in Greenville

- Only had to replace heads on 10th street approach
- Horizontal heads allow to maintain clearance over roadway and allow visibility under Railroad cantilever
- 5 section horizontal head used in place of doghouse
- Two 12" horizontal heads used were within loading limits of existing mast arm that supported three 8" heads.
- The "after" photos.....



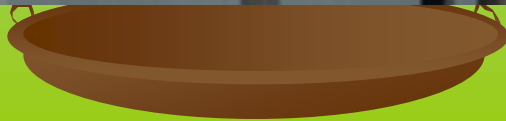








12/13/2007 3:58pm





Green Arrow on a 5 Section Horizontal Head



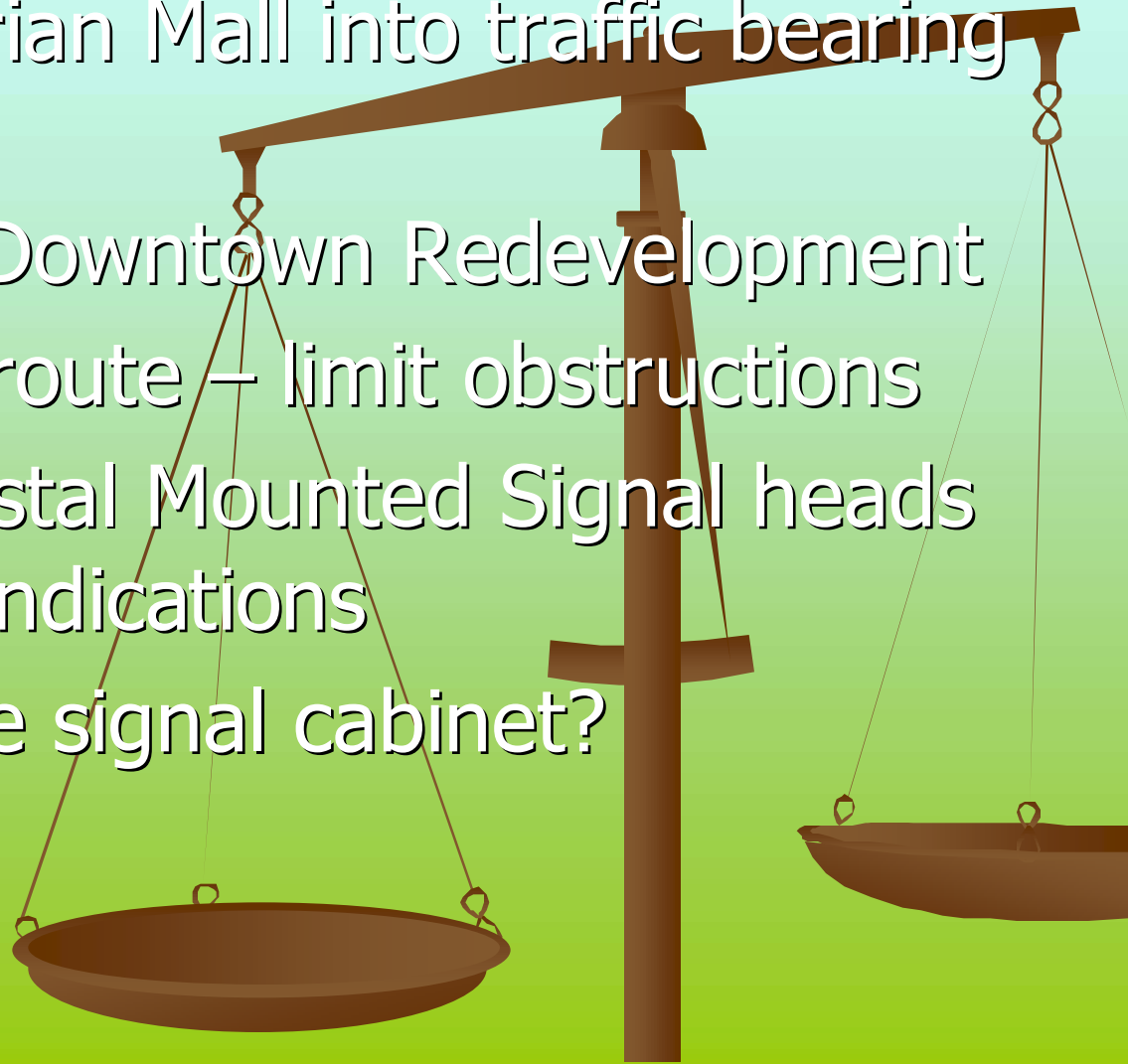
Yellow Arrow on a 5 Section Horizontal Head



12/13/2007 3:49pm

Fayetteville Street in Raleigh

- Convert Pedestrian Mall into traffic bearing street
- Centerpiece of Downtown Redevelopment
- Central Parade route – limit obstructions
- Solution – Pedestal Mounted Signal heads with Dual Red Indications
- Can you find the signal cabinet?





NB Heads with Dual Red Indications – Capitol in the background





Typical Signal Head Arrangement for Intersections Along Fayetteville Street



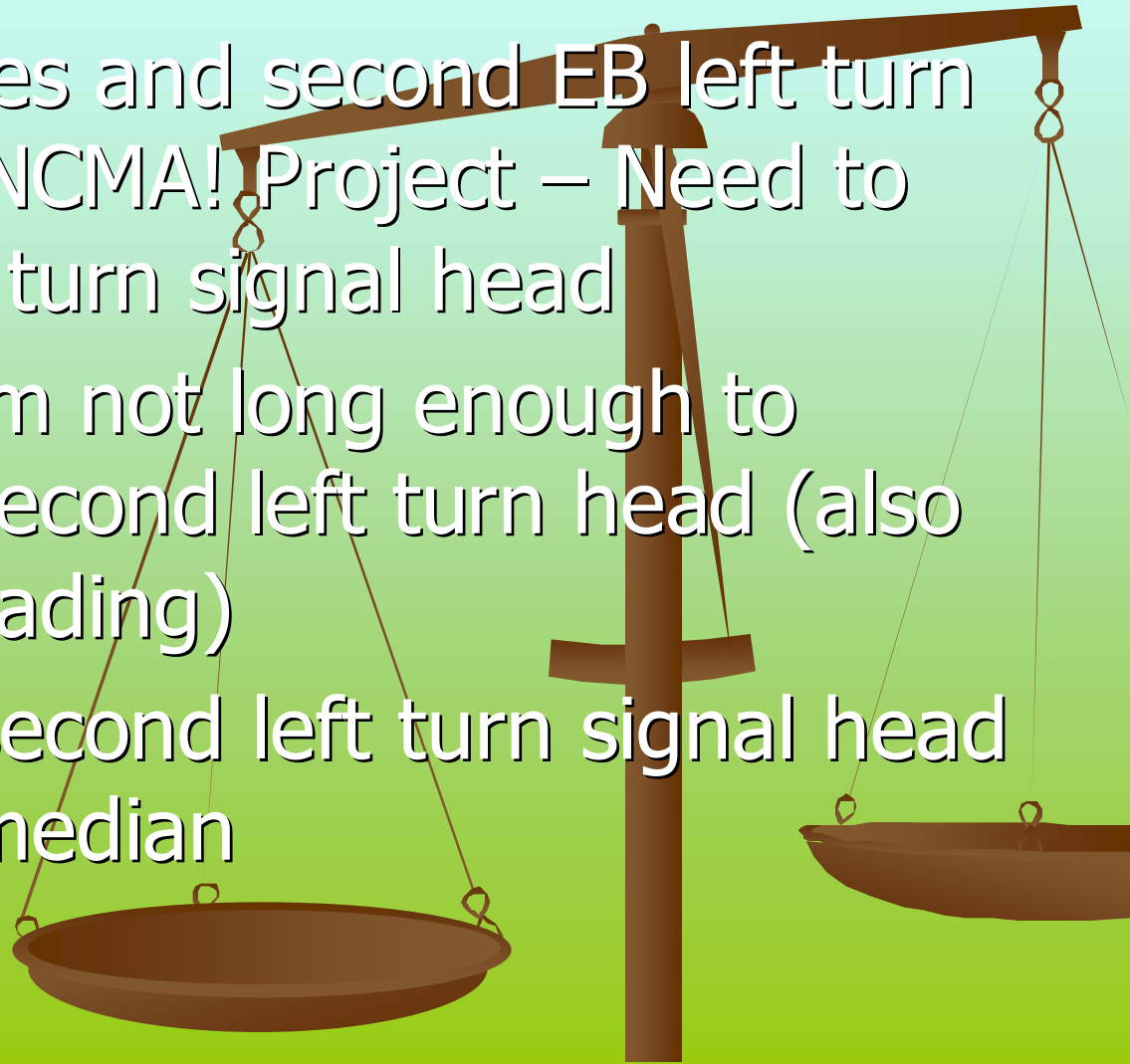
Newspaper rack and “directional assistance” on the corner



Or is it also a signal cabinet (notice keyhole below map)?

Dual Left Pedestal: Cornwallis at Alexander in RTP

- Adding Bike lanes and second EB left turn lane as part of NCMA! Project – Need to add second left turn signal head
- Existing mastarm not long enough to accommodate second left turn head (also unsure about loading)
- Solution: Add second left turn signal head on pedestal in median





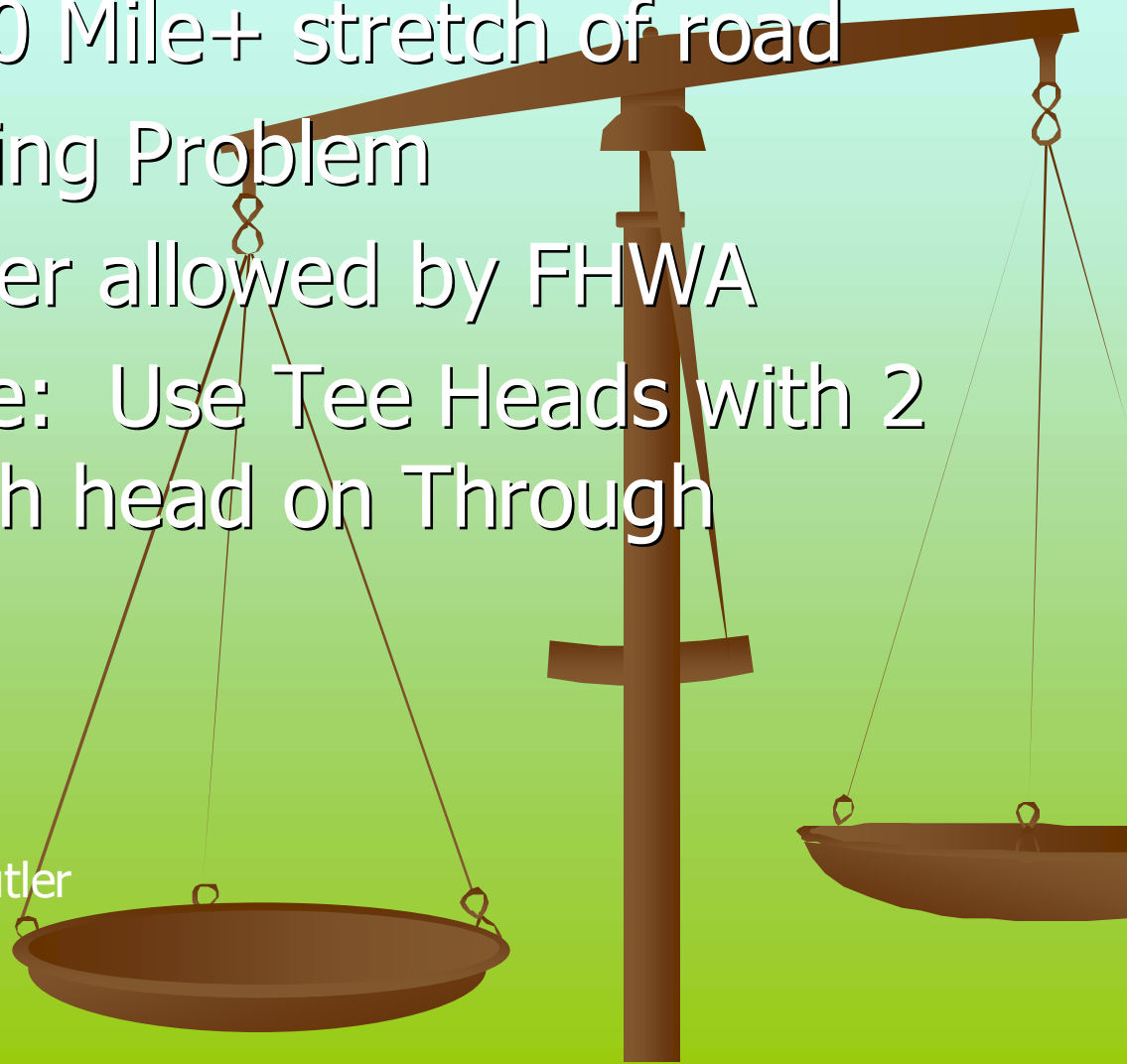




US 74-76 at NC 87 in Maco

- Only signal in 30 Mile+ stretch of road
- Red Light Running Problem
- Strobes no longer allowed by FHWA
- Countermeasure: Use Tee Heads with 2 Red Balls in each head on Through Movement

Photos Courtesy of Pate Butler





EB Approach with Signal Ahead Signs



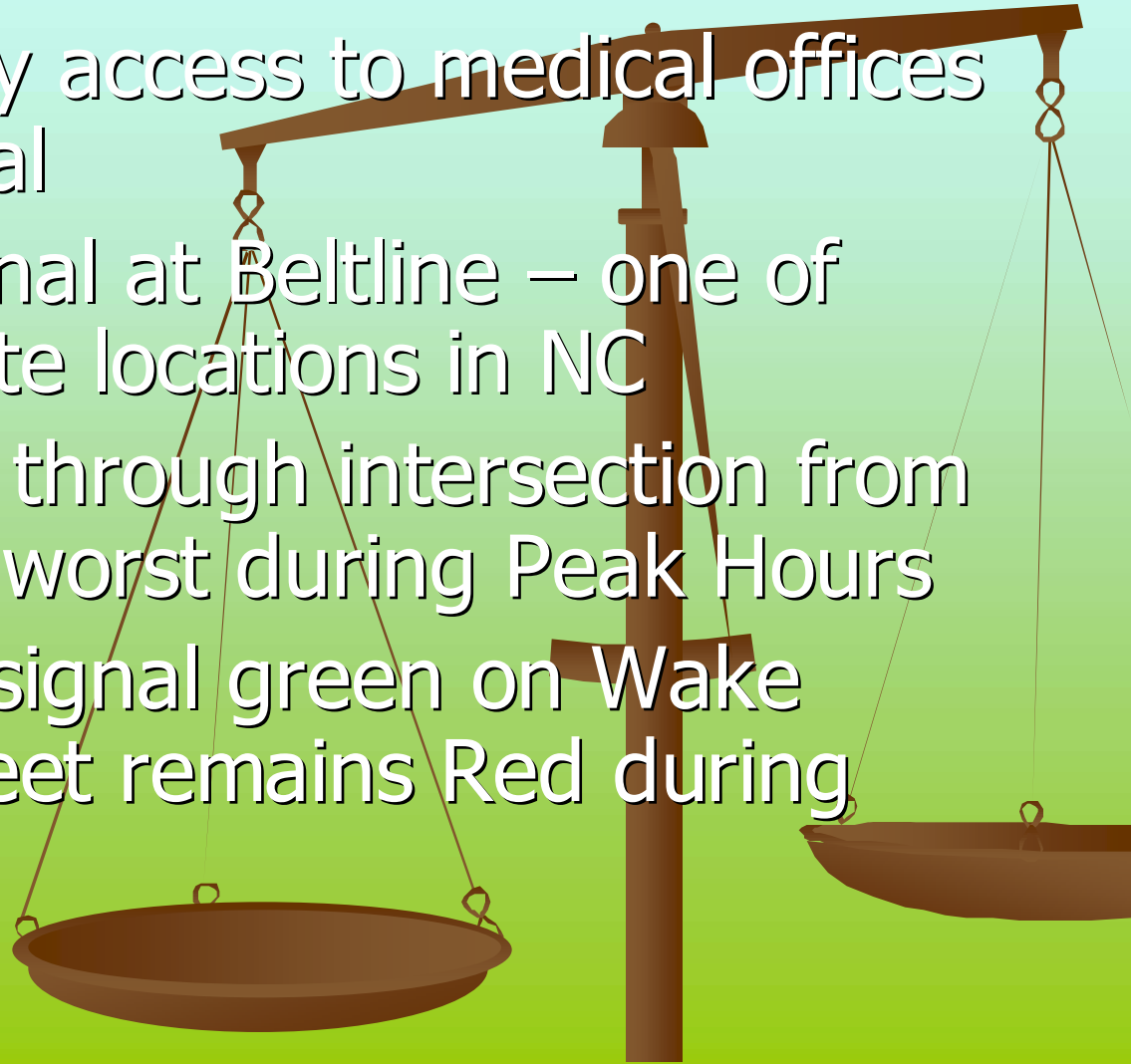
EB Tee heads – Red Display



WB Tee heads with P/P 5 section – Green Display

Time of Day Phasing: Wake Forest at Navaho in Raleigh

- Side street is key access to medical offices adjoining hospital
- 1 block from signal at Beltline – one of highest crash rate locations in NC
- Lengthy queues through intersection from Beltline signal – worst during Peak Hours
- Solution: Keep signal green on Wake Forest (Side Street remains Red during Peak Hours)





EB Signage on Navaho



EB Signage on Navaho



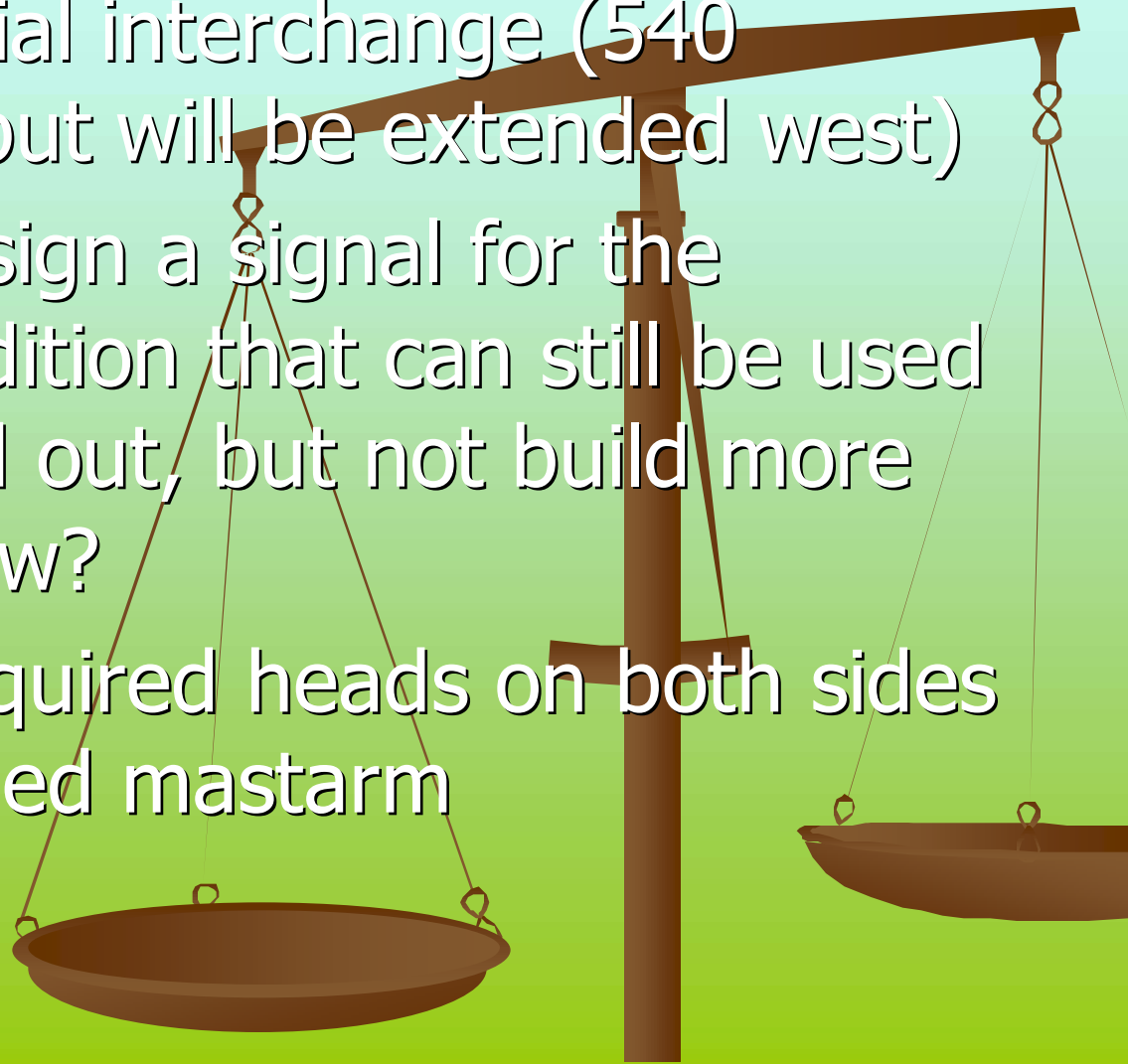
Signage on WB Navaho – Notice “Signal Remains Red” Sign



It's 4:05 PM, but guess who thinks they're going left.

NC 55 at NC 540

- Temporary partial interchange (540 currently ends but will be extended west)
- How to best design a signal for the Temporary condition that can still be used in the final build out, but not build more than needed now?
- Solution: All required heads on both sides of a single, angled mastarm





One mastarm serving all required heads - Facing EB Dual Lefts; WB Thrus on Reverse



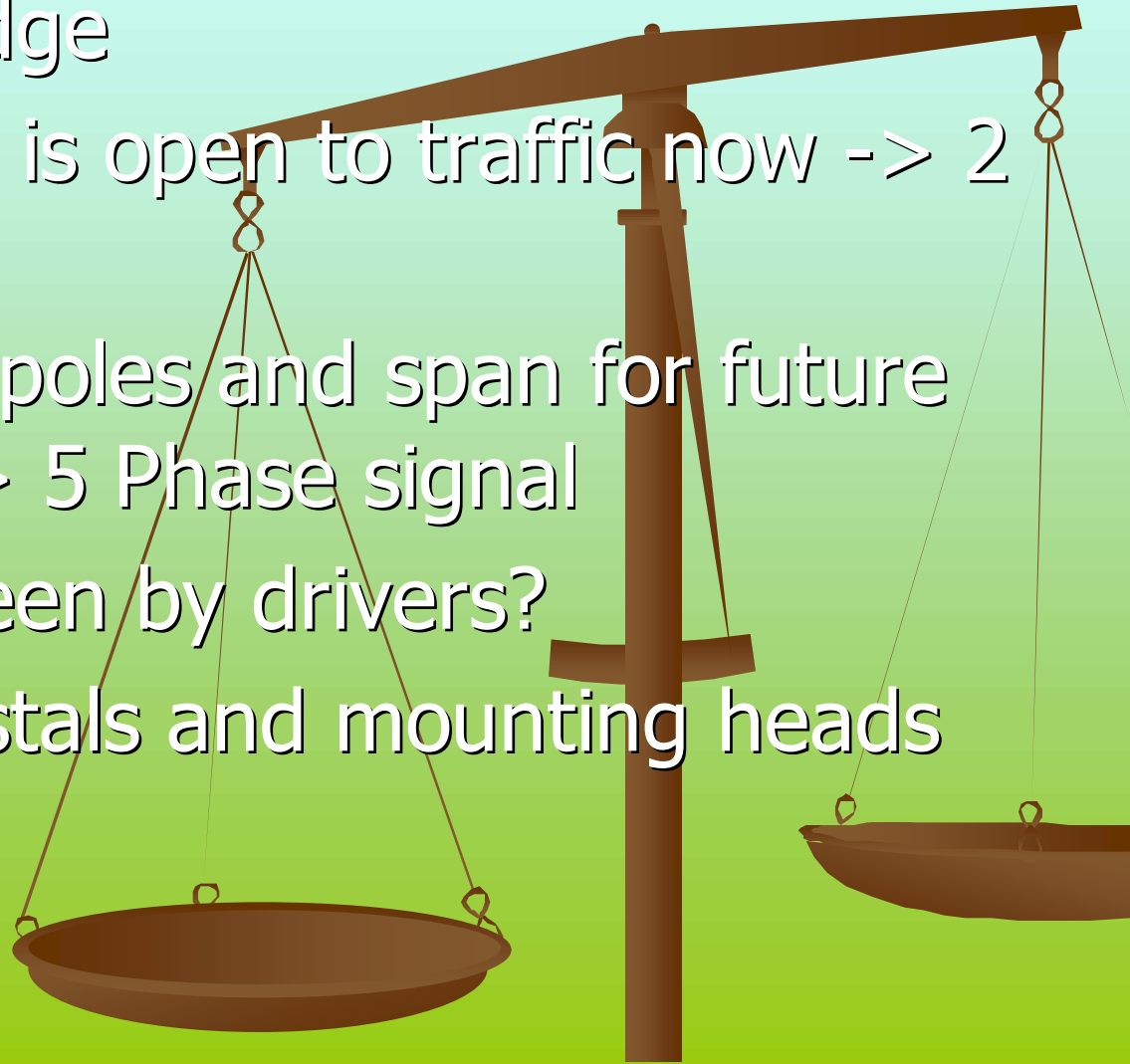
No EB Through heads currently. May not be needed in future based on build out.



Notice angle of mastarm to provide maximum visibility from stopbar

Single Point Urban Int. (SPUI): Triangle Town Blvd. at I-540

- SPUI Under Bridge
- Only 1/2 of SPUI is open to traffic now -> 2 Phase signal
- Need to design poles and span for future configuration -> 5 Phase signal
- Will heads be seen by drivers?
- Solution: Pedestals and mounting heads on strain poles









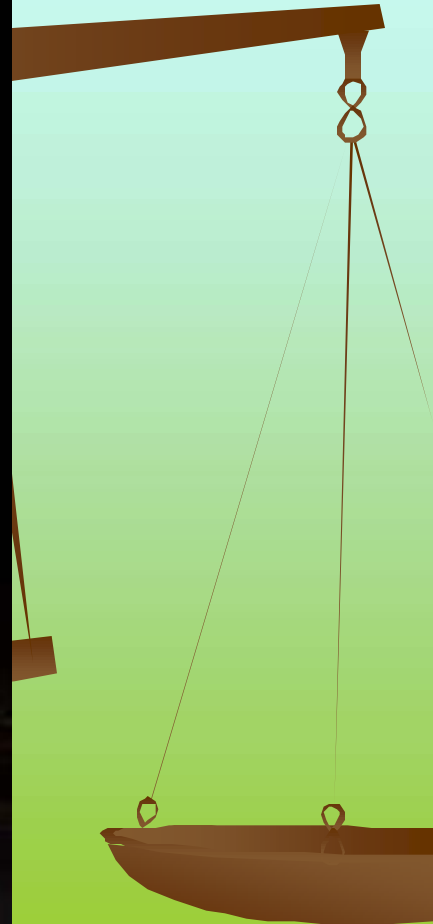












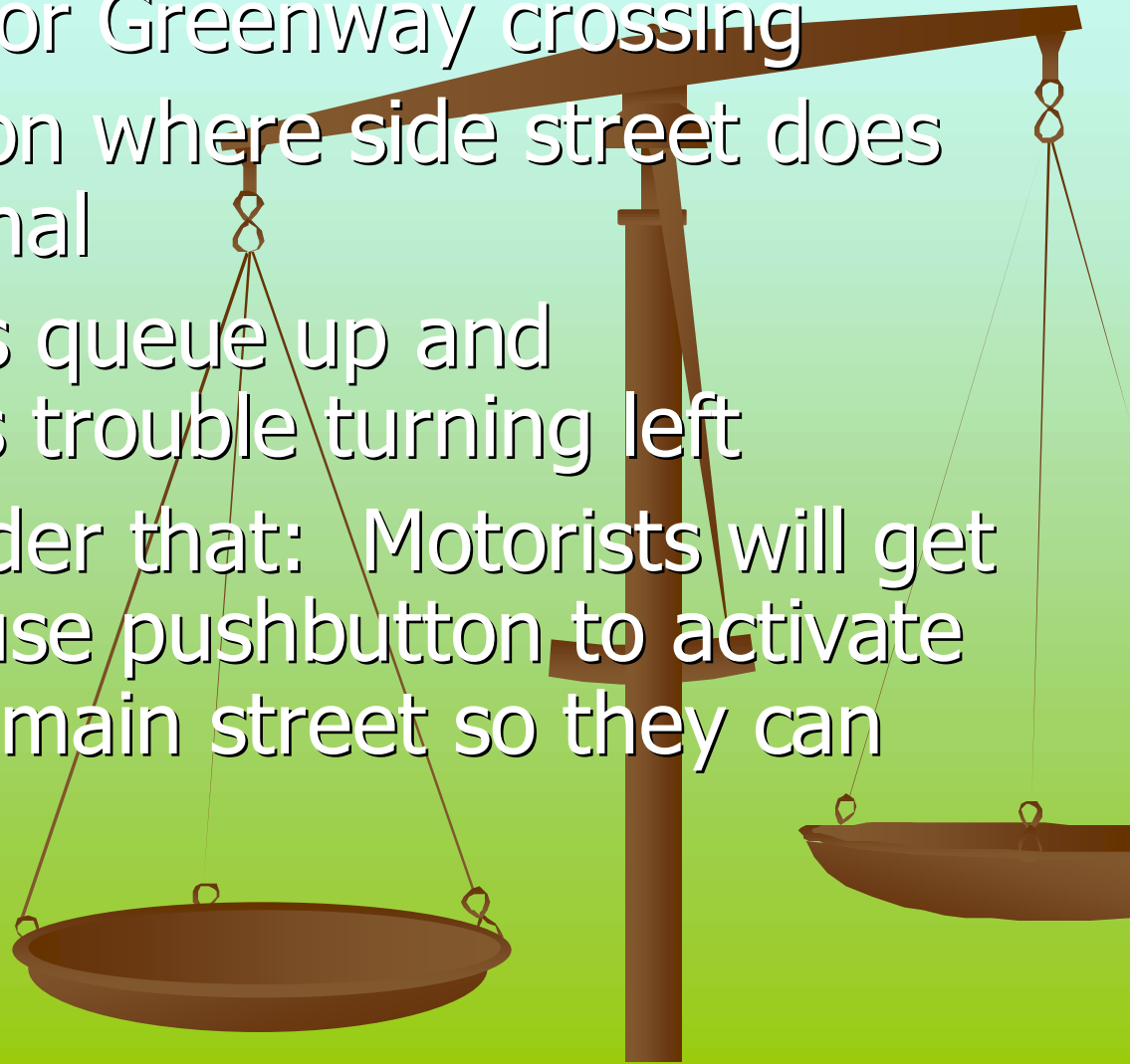
“It sounded like a good idea, but.....”

Unique ideas that looked good on paper, but don't quite function as designed.

The Greenway Signal:

Western Blvd. at Pullen Road in Raleigh

- 2 phase signal for Greenway crossing
- At an intersection where side street does not activate signal
- Side street does queue up and occasionally has trouble turning left
- We didn't consider that: Motorists will get out of car and use pushbutton to activate signal and stop main street so they can turn.





It's a normal 2 phase signal at a Tee intersection.....



...Or is it? Signal is for Ped crossing, not side street

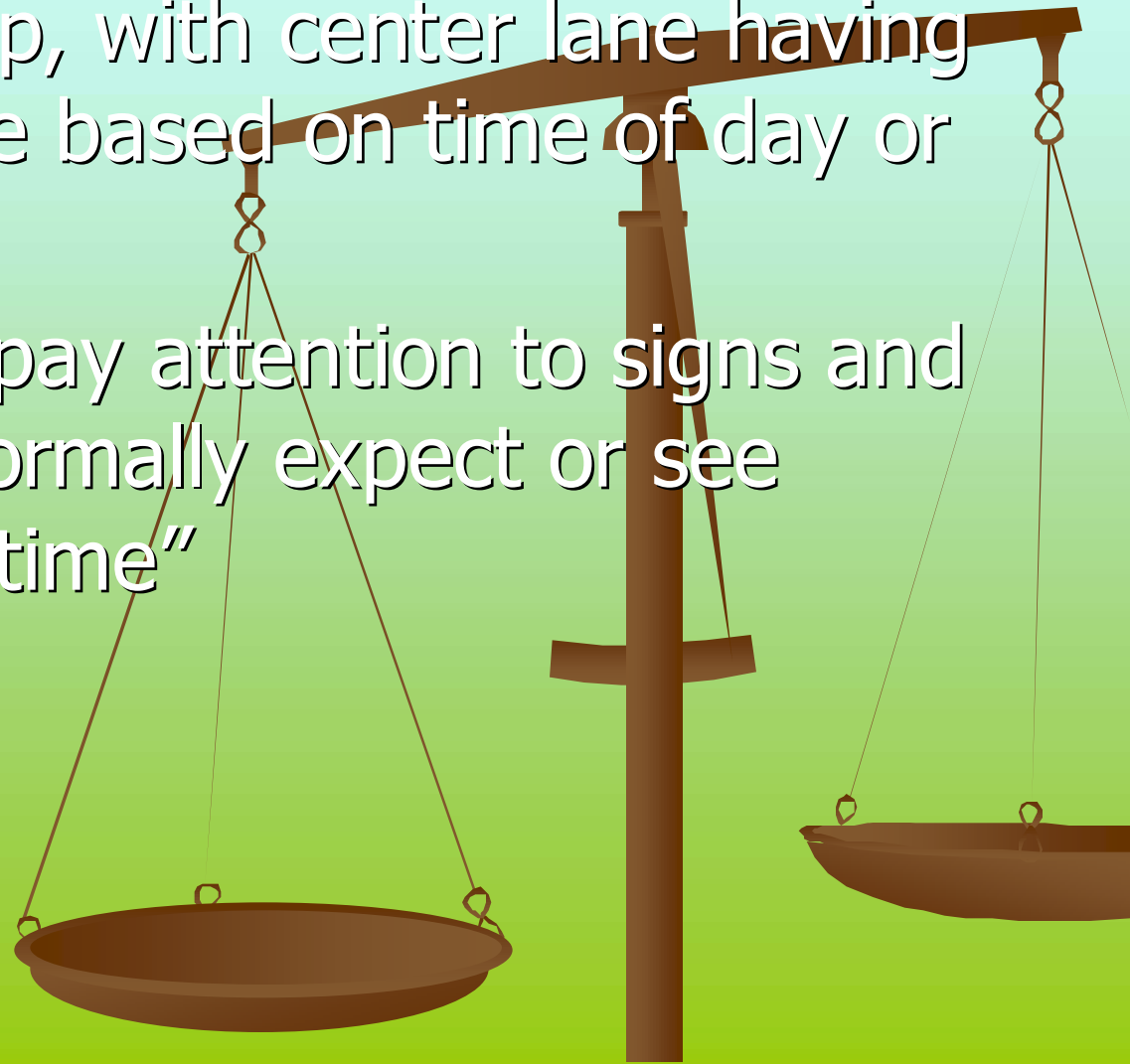


STOP Sign for side street control (can't see signal display)



Adjustable Turn Lane Sign: I-440 at Poole Road Ramps

- 3 Lane exit ramp, with center lane having ability to change based on time of day or traffic demands
- Motorists don't pay attention to signs and do what they normally expect or see during "normal time"





Notice: Left, through-right combo, and right only



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The Green SUV is waiting to go through or right, correct?



What about this truck?



Dual lefts? That's not what the signs say, but they turn anyway.



Signs do illuminate. This is display a few hours later - "Off Peak"



Reinforcement sign on Signal Span

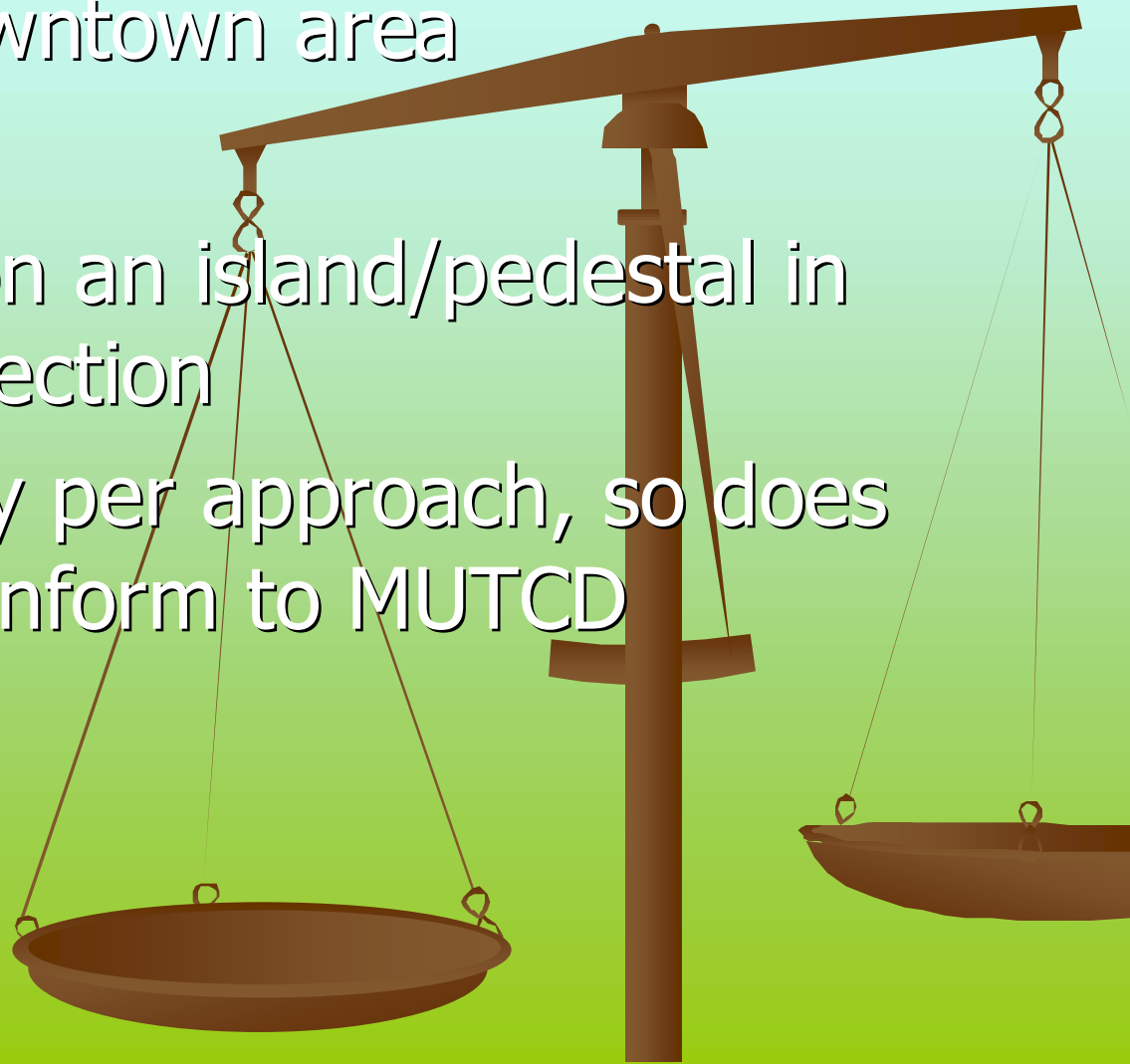
Is this.....

- A bad idea?
- Bad enforcement?
- Changing traffic patterns – plan may need updated?
- Driver ignorance?
- Violates Normal expectations?



Canajoharie, NY: Dummy Signal

- Low Speed, Downtown area
- Local landmark
- Signal located on an island/pedestal in middle of intersection
- Only one display per approach, so does not currently conform to MUTCD





07/09/2008



Maybe this is why it's called the "Dummy Light"?

- Questions??
- Comments
- Discussion
- Unique situations in your local Division/Region
- “Out of the Box” Solutions

